



SERVICE MANUAL / PARTS LIST

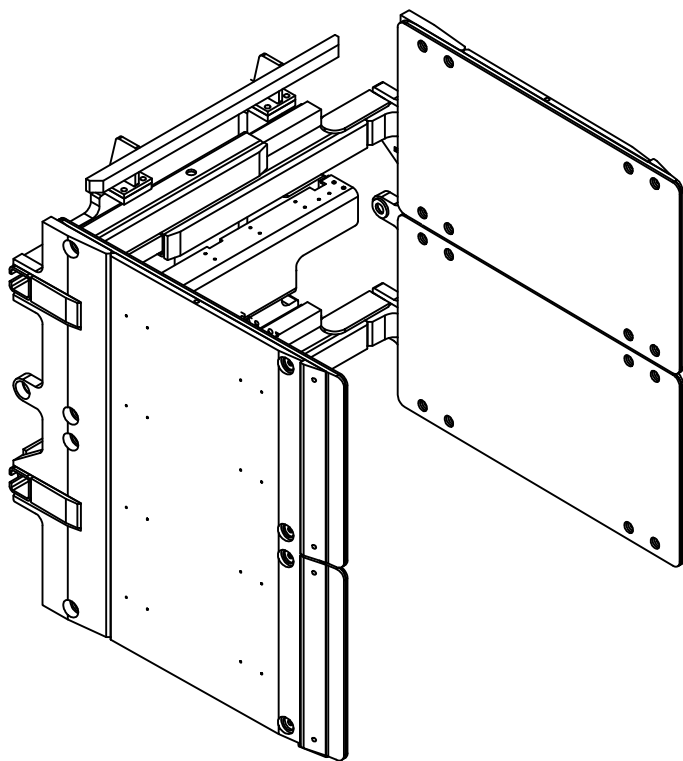
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APPLIANCE CLAMP SOFT TOUCH

MODEL #112451
PATENTS PENDING

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LIFT TRUCK REQUIREMENTS

CAPACITY

Capacity shown on the Clamp name plate is for the Clamp only. The combined truck and Clamp capacity is provided by the lift truck manufacturer.

CLAMP HYDRAULICS

Recommended Truck Pressure: 2300 to 2500 PSI (159 to 170 bar)

Hydraulic fluid: petroleum based hydraulic fluid only

Hydraulic supply group: includes hoses and take-up - one set for each function

Auxiliary valve:

2 Function (Side Shift & Clamp) = a double auxiliary valve

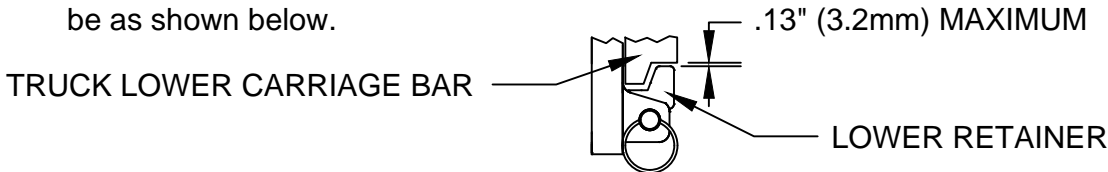
Oil Volume Settings:

Side Shift = 3 GPM

Clamp Open/Close = 7 GPM

GENERAL INSTALLATION PROCEDURES

1. Make sure that the attachment centering lug is completely seated in truck carriage center notch.
2. Clearance between the lower retainers that hold the attachment to the truck lower carriage bar should be as shown below.



3. Attach truck supply group (take-up) to clamp valve on attachment base.
4. Standing clear of the Clamp attachment cycle the attachment in and out several times. Use caution because partially filled hydraulic lines may cause erratic movement.

GENERAL INSPECTION AND MAINTENANCE

1. Check all hydraulic fittings, hoses, cylinders and valves for leakages - repair or replace as required
2. Check bladder/water pressure. If out of operating range adjust as required using Loron Pneumatic Fluid Pump #112909. Check clamp force and adjust. (See page 15.)
- 3.
4. Time Schedule: Check pressure and clamp forces every 3 weeks.
Water pressure = 4-6 psi Clamp Force = 1400 lbs. Center of bottom pad.
5. All bolts should be checked and tightened as required.
6. Check lower retainer clearance - see item 2 in General Installation Procedures above.

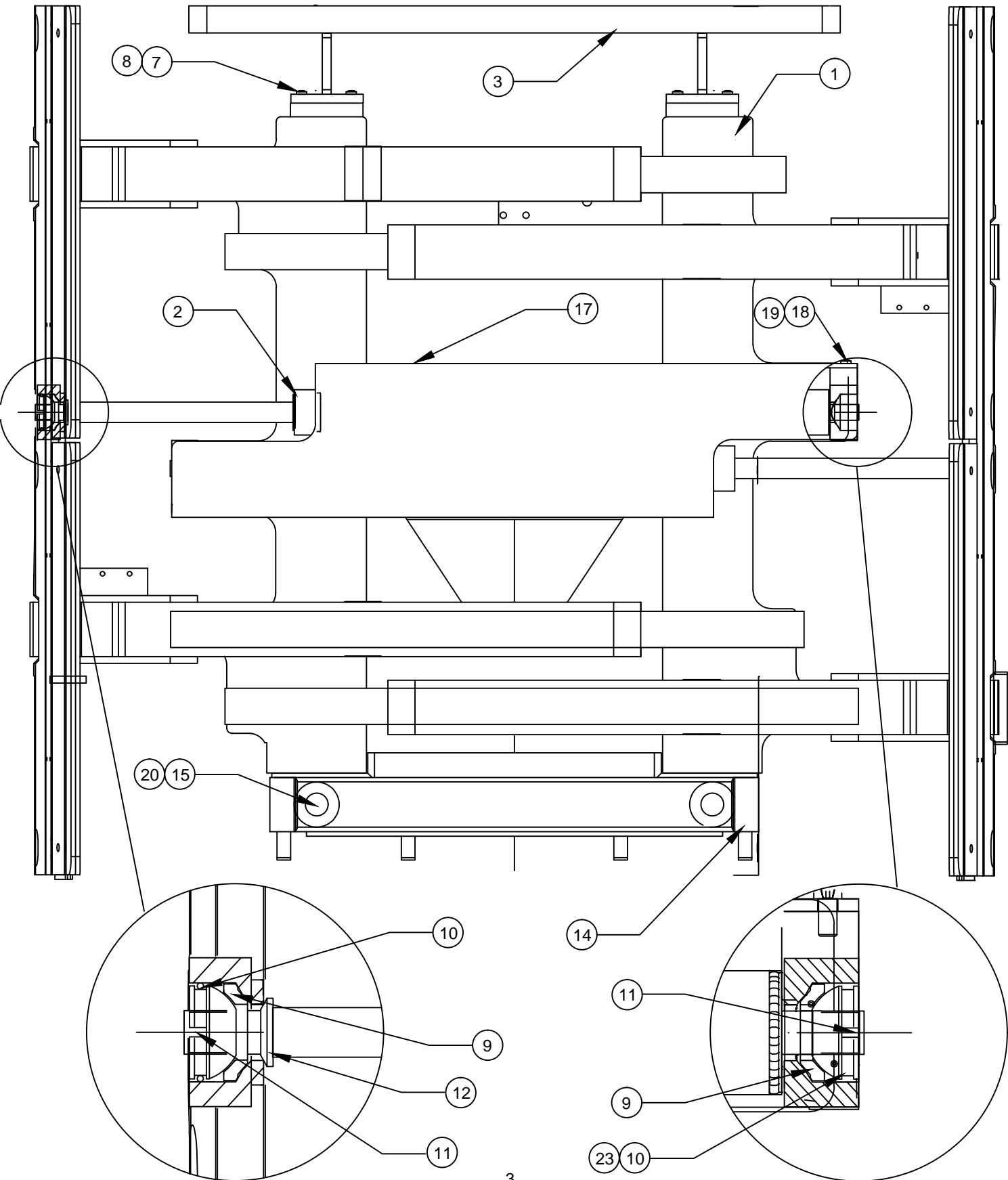
CLAMP ASSEMBLY - 1

Drawing Reference 112683.1

| # | QTY | PART # | DESCRIPTION |
|----|-----|------------|---------------------|
| 1 | 1 | 112456 | FRAME |
| 2 | 2 | 111372.4 | CYLINDER ASSEMBLY |
| 3 | 1 | 111439.2 | LOAD BACKREST |
| 4 | 4 | 111622.2 | SLIDE - FLAT |
| 5 | 8 | 111621.2 | SLIDE - ANGLE |
| 6 | 12 | 109212.5 | SHIM |
| 7 | 8 | 25G.0832 | BOLT LSP |
| 8 | 8 | 4E.08 | LOCKWASHER LSP |
| 9 | 4 | 110730 | SPHERICAL SEAT |
| 10 | 4 | 110731 | SPHERICAL BEARING |
| 11 | 4 | 100574.86 | COTTER PIN LSP |
| 12 | 2 | 111380 | CYLINDER WASHER |
| 13 | 2 | 107870 | LOWER RETAINER |
| 14 | 1 | 111423 | LOWER LOAD BACKREST |
| 15 | 2 | 11G.1028 | BOLT LSP |
| 16 | 12 | 111619 | SLIDE BUTTON |
| 17 | 1 | 112468 | CYLINDER GUARD |
| 18 | 4 | 25G.0608 | BOLT LSP |
| 19 | 4 | 2F.06 | WASHER LSP |
| 20 | 2 | 4E.10 | LOCK WASHER LSP |
| 21 | 2 | 11G.08136 | BOLT LSP |
| 22 | 2 | 17D.08 | ESNA NUT LSP |
| 23 | 4 | 100029.314 | O-RING LSP |

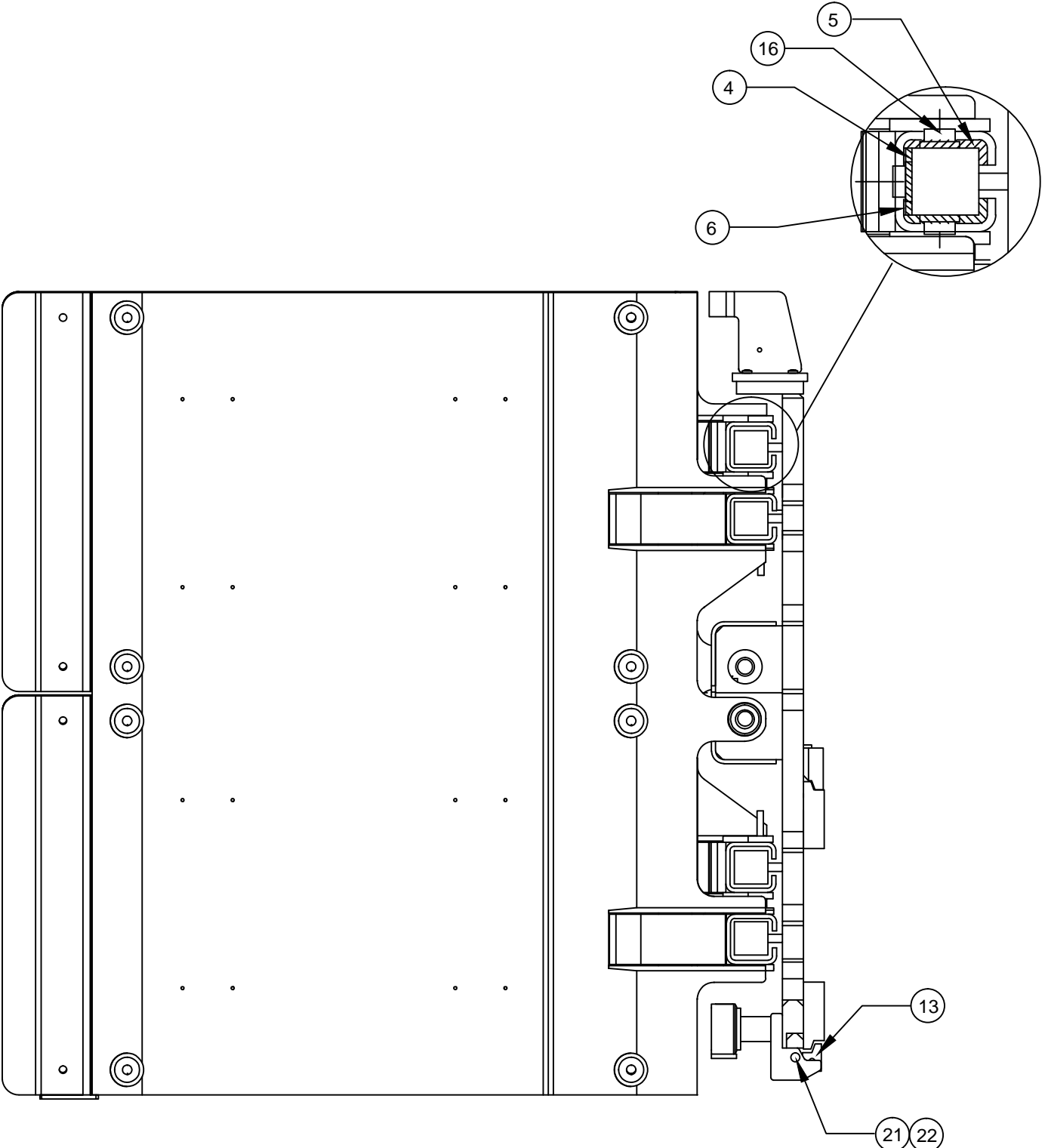
CLAMP ASSEMBLY - 2

Drawing Reference 112683.1



CLAMP ASSEMBLY - 3

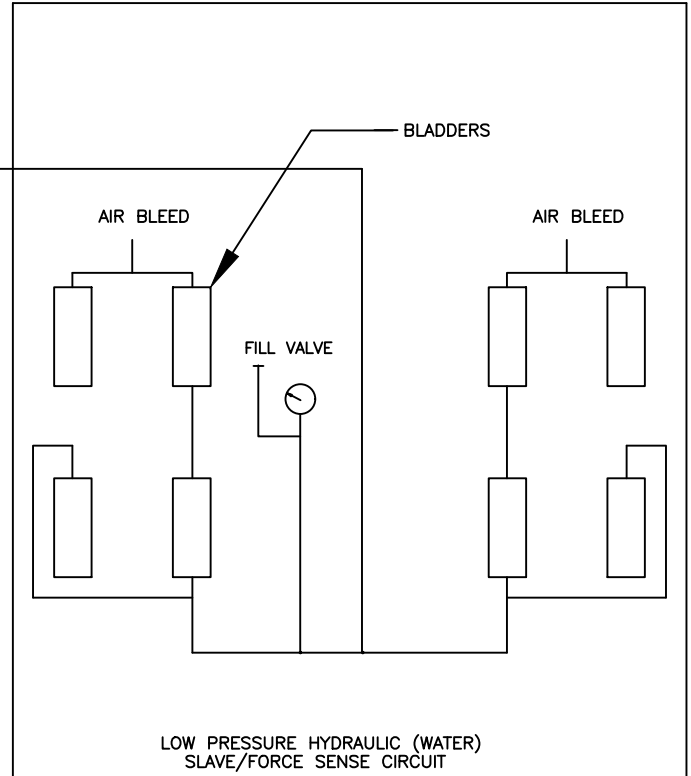
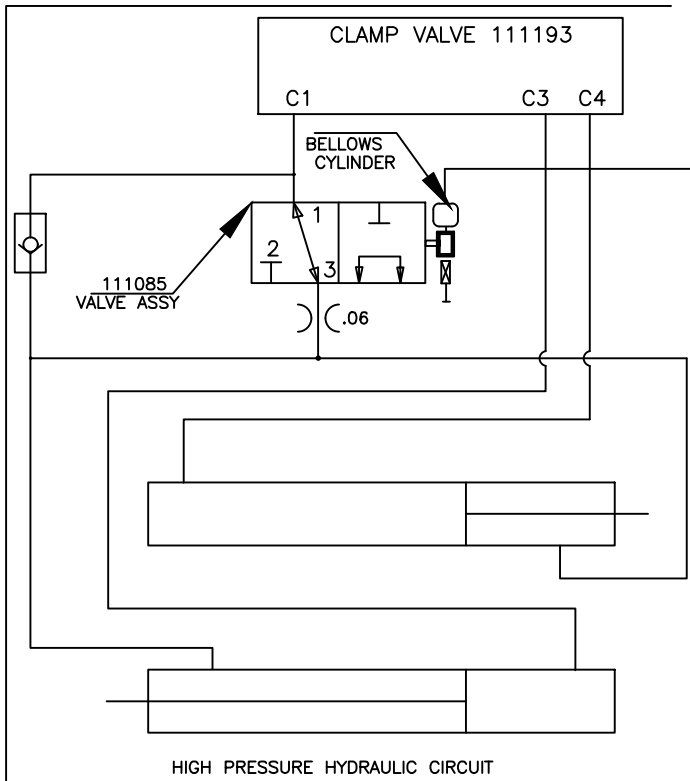
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BLADDER HYDRAULIC ASSEMBLY - 1

Drawing Reference 112875.1

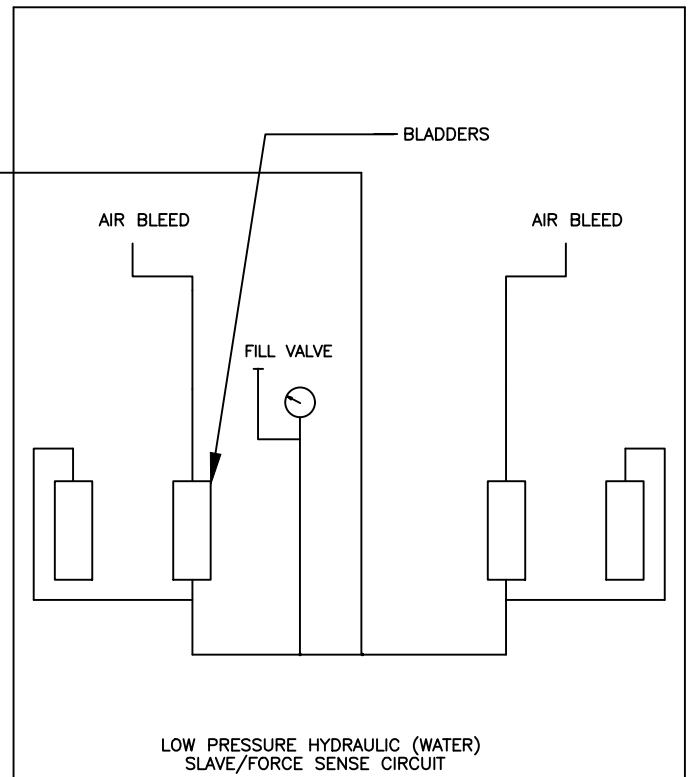
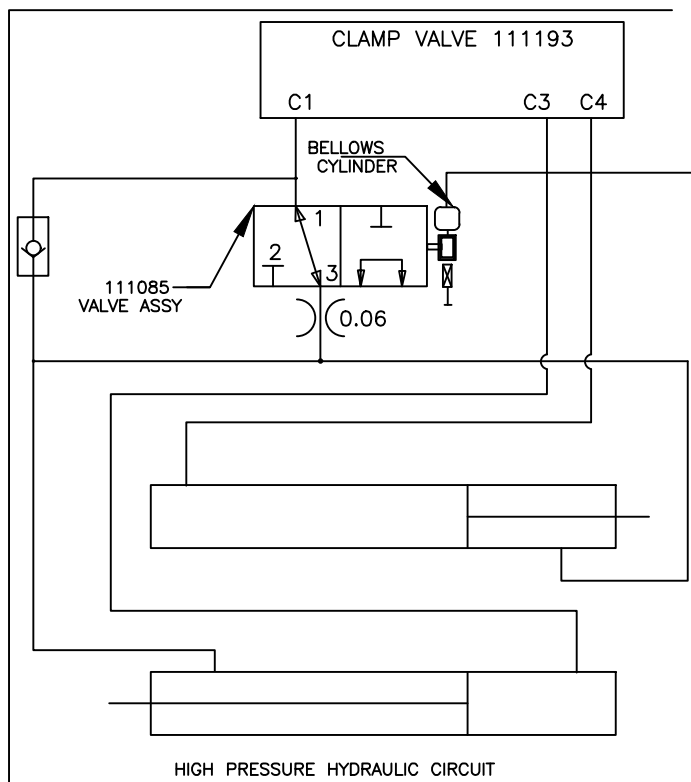
| # | QTY | PART NO. | DESCRIPTION | 18 | 2 | 111290.0250 | HOSE |
|----|-----|-------------|-------------------|----|----|-------------|---|
| 1 | 3 | 111350 | AIR TANK VALVE | 19 | 8 | 111030 | BLADDER |
| 2 | 12 | 111295 | HOSE CLAMP | 20 | 32 | 9G.0412 | BOLT LSP |
| 3 | 1 | 111290.0025 | HOSE | 21 | 16 | 111471 | CLAMP BAR |
| 4 | 1 | 111296 | PRESSURE GAUGE | 22 | 8 | 109256 | HOSE CLAMP |
| 5 | 1 | 111543.01 | FITTING 90° ELBOW | 23 | 8 | 25G.0508 | BOLT LSP |
| 6 | 1 | 111292 | BRANCH TEE | 24 | 2 | 113026.0360 | COVER HOSE |
| 7 | 1 | 111290.0178 | HOSE | 25 | 4 | 111128 | HOSE GUIDE |
| 8 | 4 | 111293 | RUN TEE | 26 | 12 | 25G.0512 | BOLT LSP |
| 9 | 1 | 111290.0155 | HOSE | 27 | 1 | 111289 | PIPE ELBOW |
| 10 | 1 | 111290.0175 | HOSE | 28 | 2 | 111654 | PLUG |
| 11 | 1 | 111290.0805 | HOSE | 29 | 2 | 111510 | SPRING |
| 12 | 1 | 111290.0960 | HOSE | 30 | 16 | 111878 | .19 GAUGE STAINLESS STEEL WIRE |
| 13 | 1 | 111299 | HOSE CLIP | 31 | 3 | 111653 | VALVE CAP |
| 14 | 1 | 25G.0516 | BOLT LSP | 32 | 2 | 111290.0118 | HOSE |
| 15 | 2 | 111290.0027 | HOSE | 33 | 1 | 111085 | DIRECTIONAL; VALVE ASSEMBLY -REFERENCE- |
| 16 | 2 | 111290.0127 | HOSE | | | | |
| 17 | 2 | 111290.0085 | HOSE | | | | |



BLADDER HYDRAULIC ASSEMBLY - 1

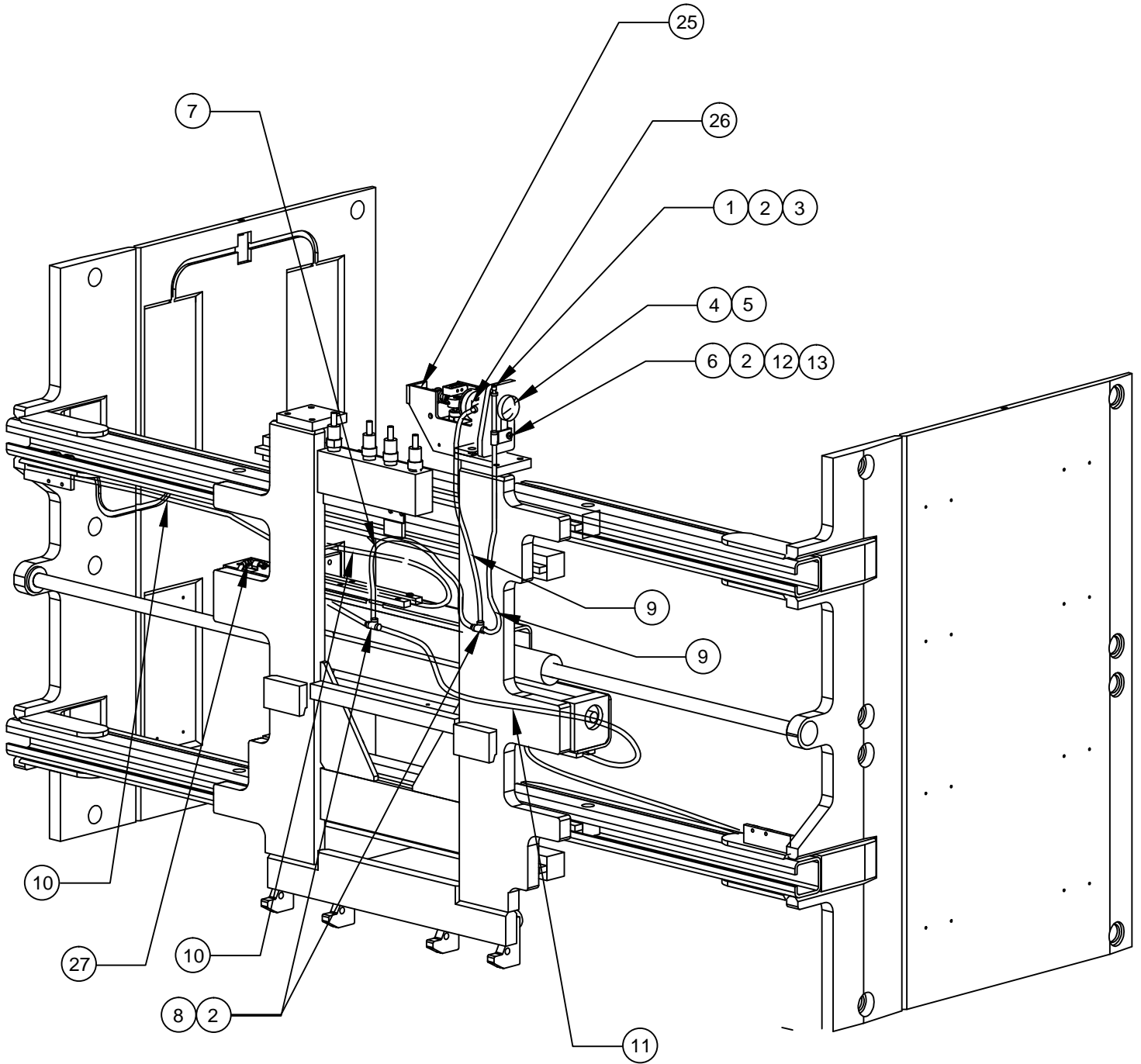
Drawing Reference 112469.1

| | | | | | | | |
|----|-----|-------------|-------------------|----|----|-------------|--------------------------------------|
| # | QTY | PART # | DESCRIPTION | 17 | 1 | 111654 | CAP |
| 1 | 3 | 111350 | AIR TANK VALVE | 18 | 24 | 9G.0412 | BOLT LSP |
| 2 | 12 | 111295 | HOSE CLAMP | 19 | 8 | 111471 | CLAMP BAR |
| 3 | 1 | 111290.0015 | HOSE | 20 | 8 | 109256 | HOSE CLAMP |
| 4 | 1 | 111296 | PRESSURE GAUGE | 21 | 8 | 25G.0508 | BOLT LSP |
| 5 | 1 | 111543.01 | 90° FITTING ELBOW | 22 | 2 | 113026.0360 | COVER HOSE |
| 6 | 1 | 111292 | BRANCH TEE | 23 | 4 | 111128 | HOSE GUIDE |
| 7 | 1 | 111290.0082 | HOSE | 24 | 12 | 25G.0512 | BOLT LSP |
| 8 | 3 | 111293 | RUN TEE | 25 | 1 | 111085 | DIRECTIONAL VALVE ASSEMBLY REFERENCE |
| 9 | 2 | 111290.0180 | HOSE | 26 | 1 | 111289 | PIPE ELBOW |
| 10 | 1 | 111290.1070 | HOSE | 27 | 2 | 111510 | SPRING |
| 11 | 1 | 111290.0830 | HOSE | 28 | 16 | 111878 | 19 GAUGE STAINLESS WIRE TIE |
| 12 | 1 | 111299 | HOSE CLIP | 29 | 2 | 111290.0277 | HOSE |
| 13 | 1 | 25G.0516 | BOLT LSP | 30 | 8 | 111971 | RUBBER SPRING |
| 14 | 4 | 111030 | BLADDER | 31 | 8 | 101633 | WASHER |
| 15 | 1 | 112470 | 90° TUBE ELBOW | 32 | 2 | 111290.0027 | HOSE |
| 16 | 2 | 111290.0360 | HOSE | | | | |



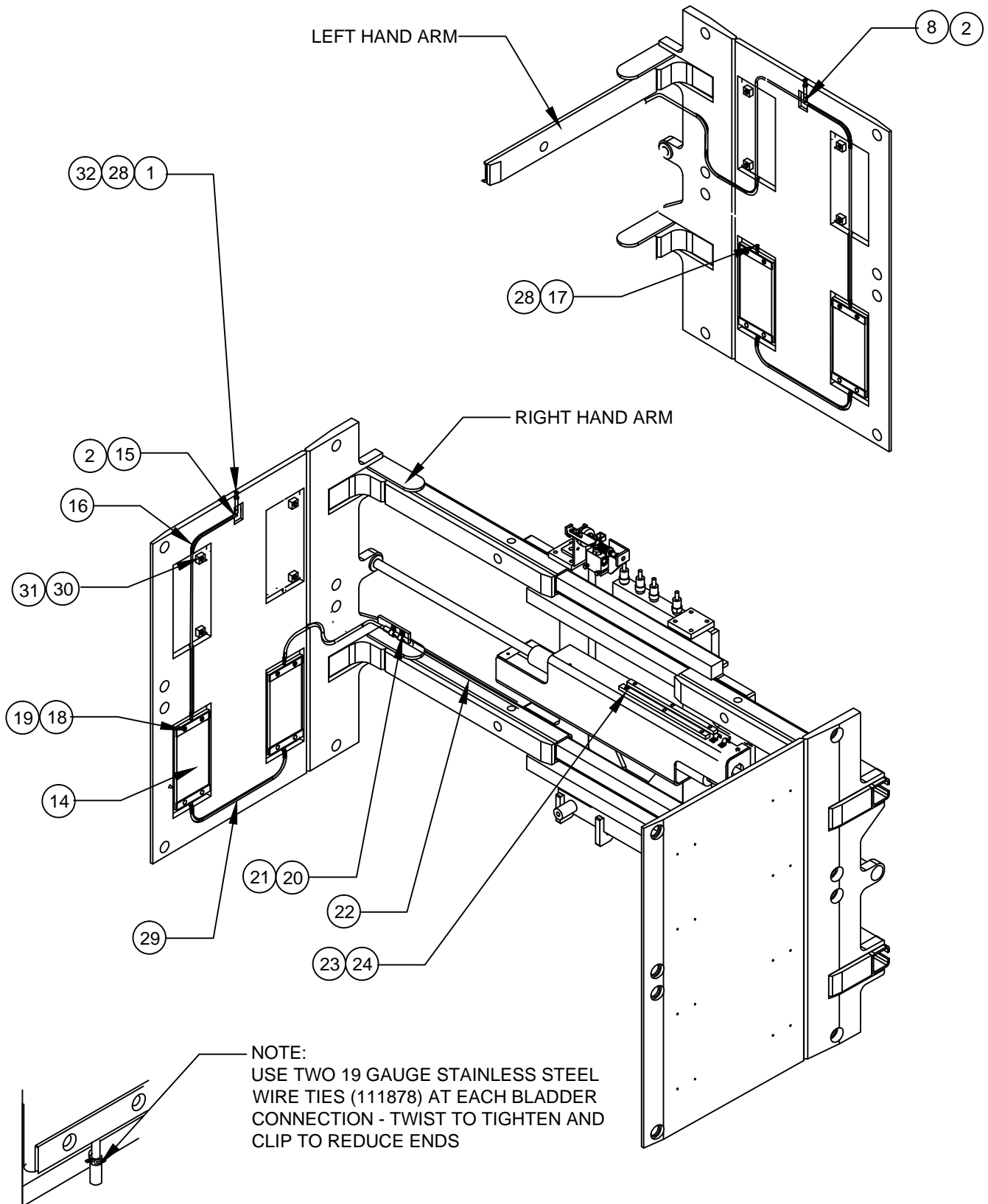
BLADDER HYDRAULIC ASSEMBLY - 2

Drawing Reference 112469.1



BLADDER HYDRAULIC ASSEMBLY - 3

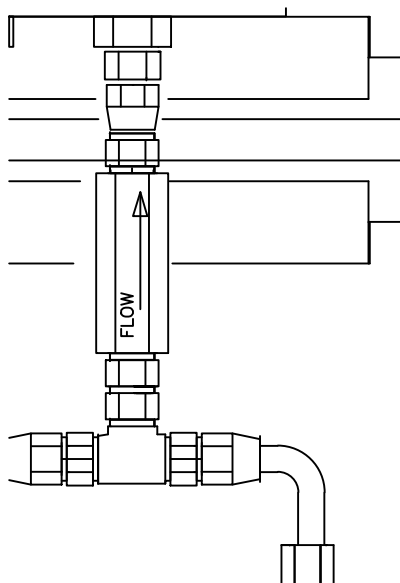
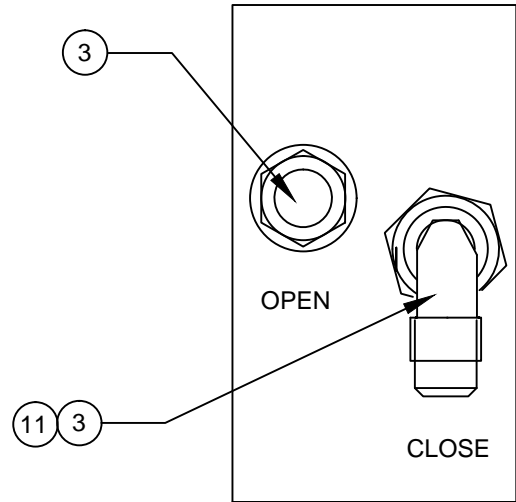
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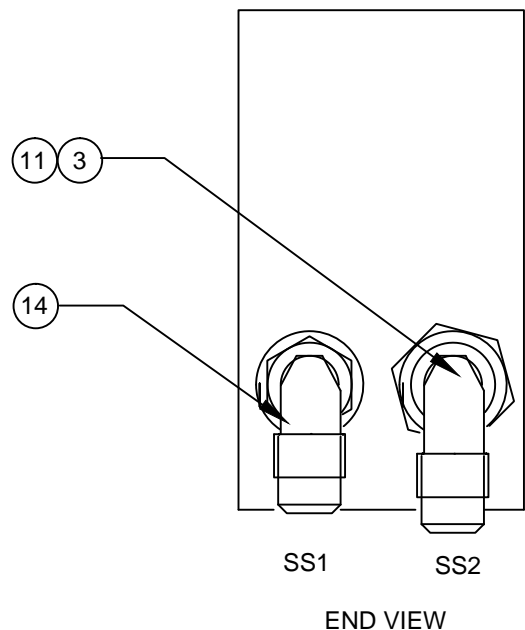
HYDRAULIC ASSEMBLY - 1

Drawing Reference 112452

| # | QTY | PART # | DESCRIPTION |
|----|-----|-------------|---|
| 1 | 1 | 111193 | CLAMP VALVE |
| 2 | 2 | 25G.0524 | BUTTON HEAD BOLT LSP |
| 3 | 7 | 100676.05 | STRAIGHT THREAD ADAPTER O-RING #6-6 |
| 4 | 2 | 111518.06 | FITTING ADAPTER 04 PIPE - 06 JIC STRAIGHT |
| 5 | 1 | 111085 | DIRECTIONAL VALVE ASSEMBLY |
| 6 | 1 | 100227.05 | FITTING UNION TEE LSP |
| 7 | 1 | 111123 | IN-LINE CHECK VALVE |
| 8 | 1 | 103411.0380 | HOSE ASSEMBLY |
| 9 | 1 | 100674.0290 | HOSE ASSEMBLY |
| 10 | 1 | 100678.05 | O-RING TEE BRANCH FITTING #6 |
| 11 | 2 | 100440.05 | 90° FITTING-SWIVEL #6JIC |
| 12 | 1 | 100674.0300 | HOSE ASSEMBLY |
| 13 | 1 | 100674.0220 | HOSE ASSEMBLY |
| 14 | 4 | 100095.05 | 90° ELBOW FITTING #6 O-RING |
| 15 | 1 | 100674.0370 | HOSE ASSEMBLY |
| 16 | 1 | 100674.0180 | HOSE ASSEMBLY |
| 17 | 1 | 111514 | VALVE GUARD |
| 18 | 1 | 100222 | FITTING 90° RESTRICTOR |
| 19 | 1 | 25G.0520 | BUTTON HEAD BOLT |
| 20 | 1 | 4F.05 | WASHER FLAT |
| 21 | 1 | 17D.05 | NUT NYLOCK |

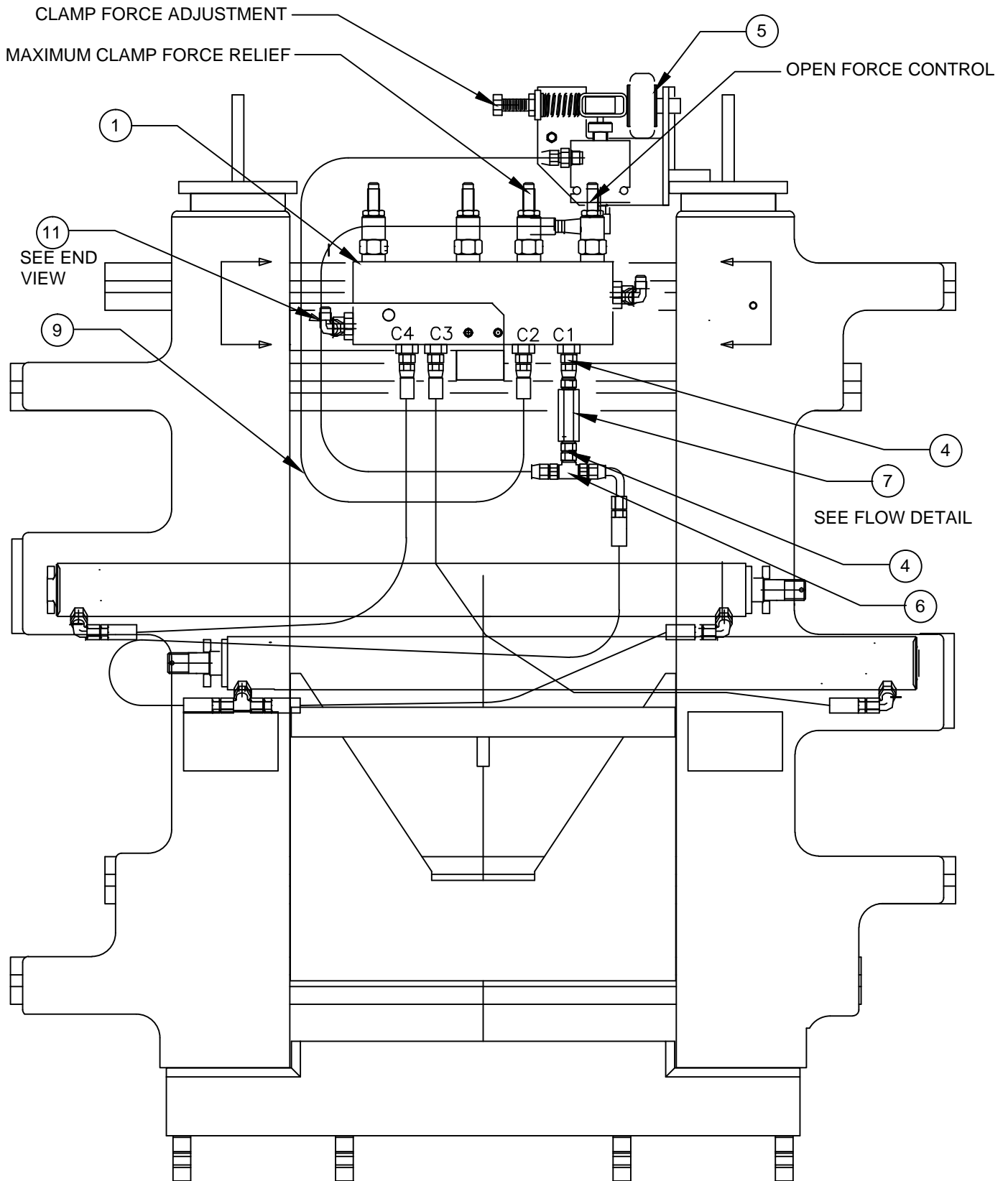


FLOW DETAIL



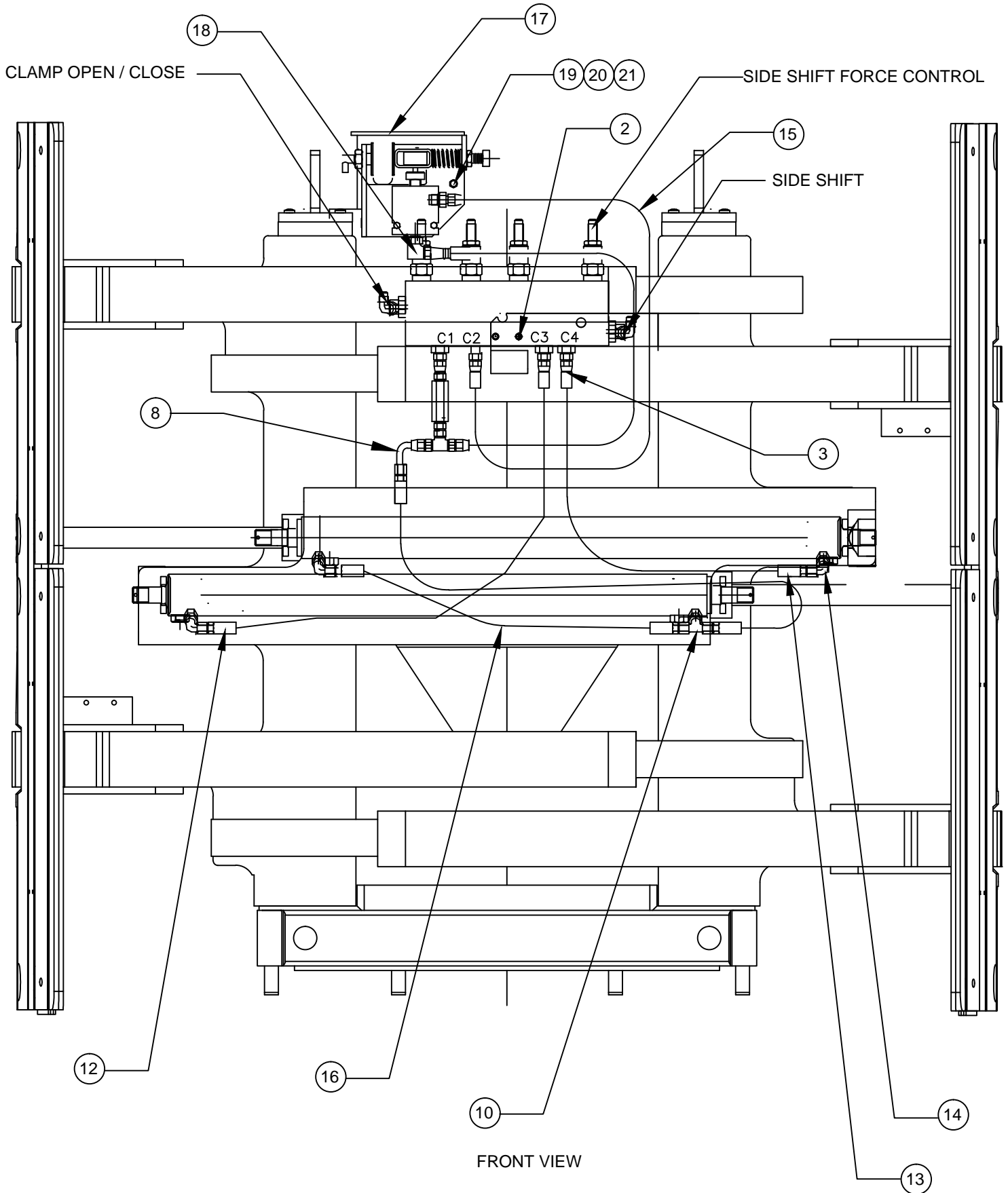
HYDRAULIC ASSEMBLY - 2

Drawing Reference 112452



HYDRAULIC ASSEMBLY - 3

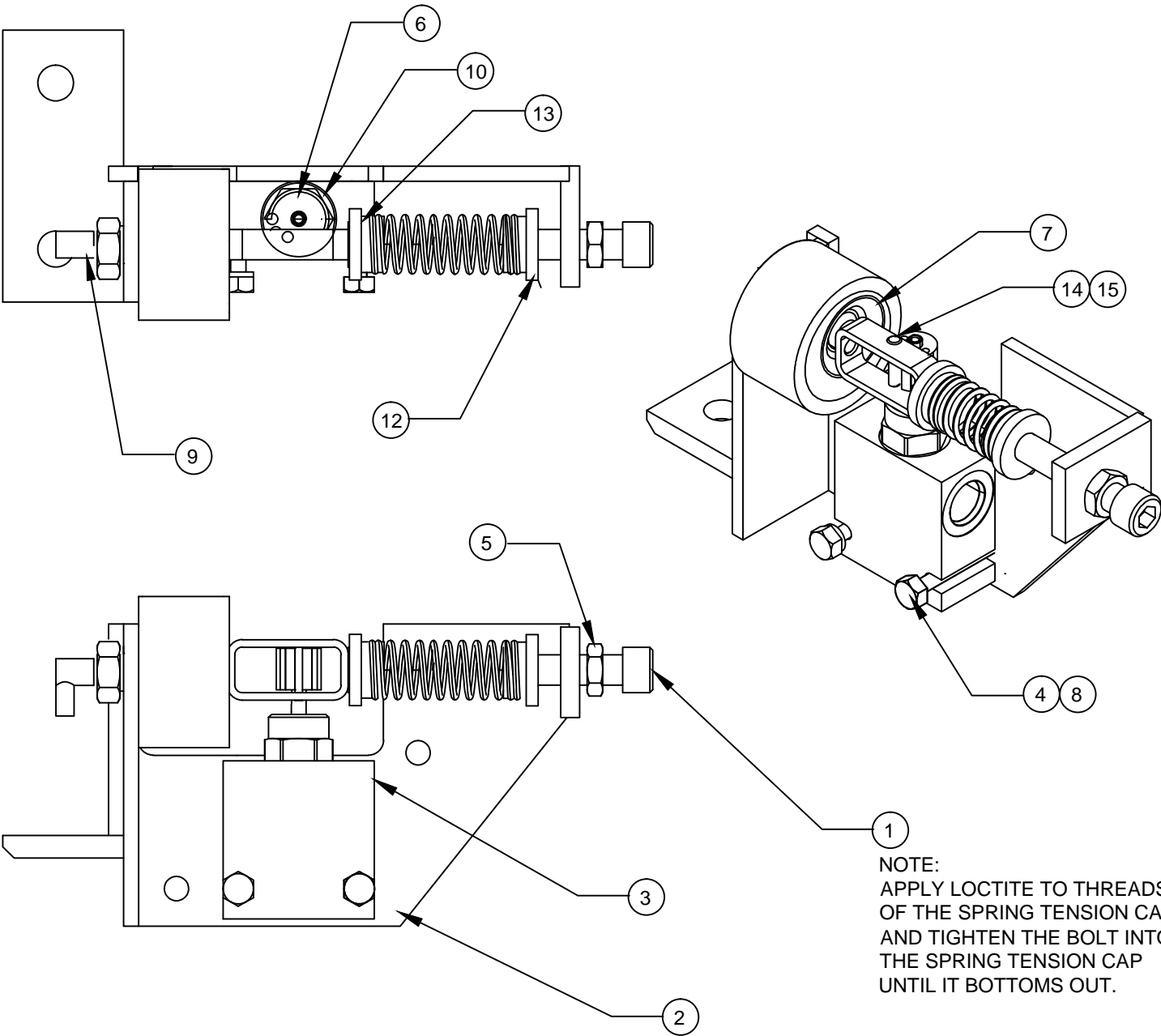
Drawing Reference 112452



CLAMP FORCE CONTROL VALVE

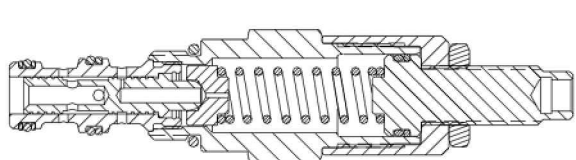
Drawing Reference 111085

| # | QTY | PART # | DESCRIPTION | 9 | 1 | 1D.10 | HEX NUT |
|---|-----|----------|---------------------|----|---|-----------|--------------------|
| 1 | 1 | 11G.0844 | BOLT | 10 | 1 | 111328 | WHEEL HOUSING |
| 2 | 1 | 111573 | MOUNTING PLATE WDMT | 11 | 1 | 111097 | SPRING |
| 3 | 1 | 111094 | DIRECTIONAL | 12 | 1 | 111098 | SPRING TENSION CAP |
| 4 | 2 | 4E.04 | LOCKWASHER | 13 | 1 | 111572 | SPRING CAP |
| 5 | 1 | 7D.08 | JAM NUT | 14 | 1 | 111655 | CLEVIS PIN |
| 6 | 1 | 110906 | WHEEL | 15 | 1 | 100574.28 | COTTER PIN |
| 7 | 1 | 111091 | AIR SPRING | | | | |
| 8 | 2 | 1C.0424 | BOLT | | | | |

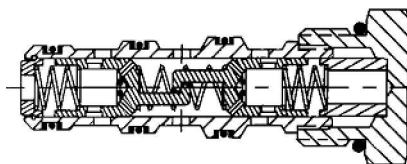


CONTROL VALVE

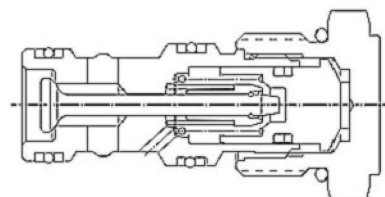
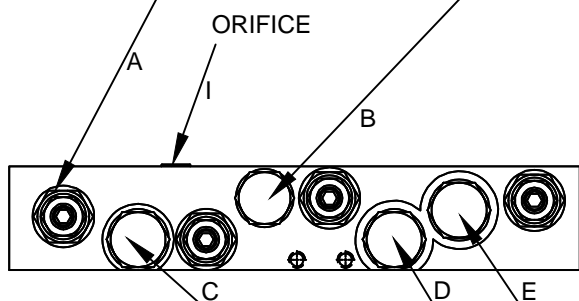
Drawing Reference 111193



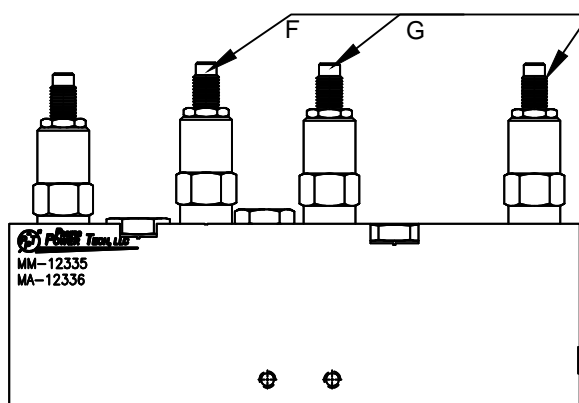
**111627 REDUCE/REL. VALVE TORQUE 15-20 FT/LBS
SEAL KIT 112065**



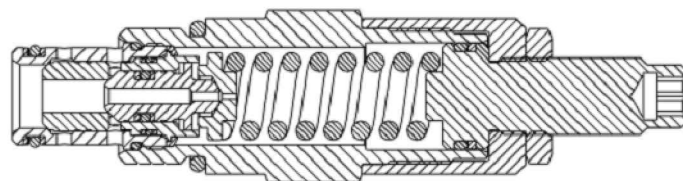
**103813 FLOW DIVIDER TORQUE
10-12 FT/LBS 104711 SEAL KIT**



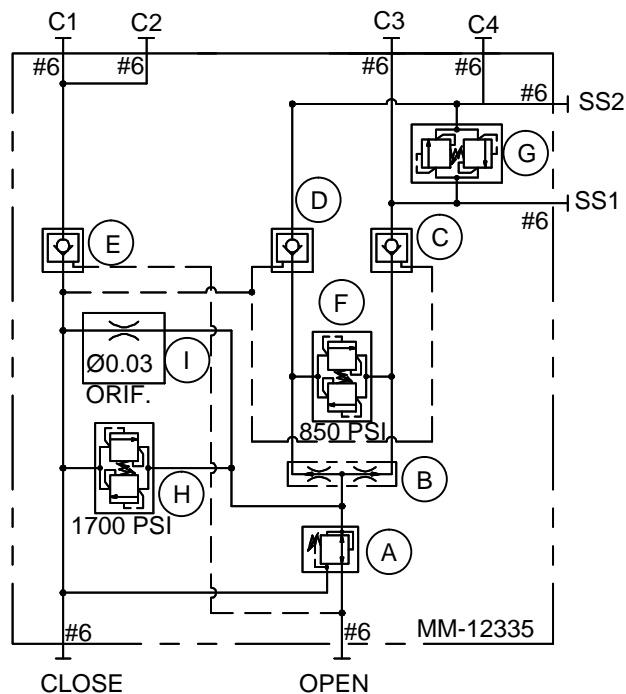
**111244 CHECK VALVE TORQUE
30-35 FT/LBS SEAL KIT 112059**



**112406.1 & 112406.2(G) RELIEF TORQUE
20-25 FT/LBS SEAL KIT 112064**



HYDRAULIC SCHEMATIC



NOTE:

1. Lubricate threads & seals prior to assembly.

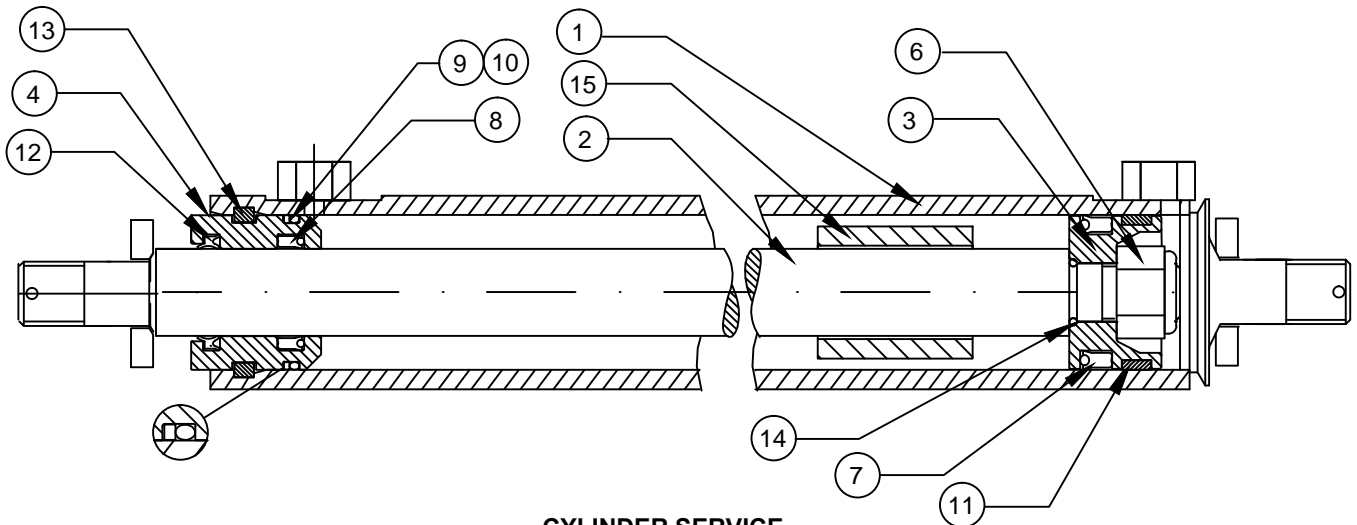
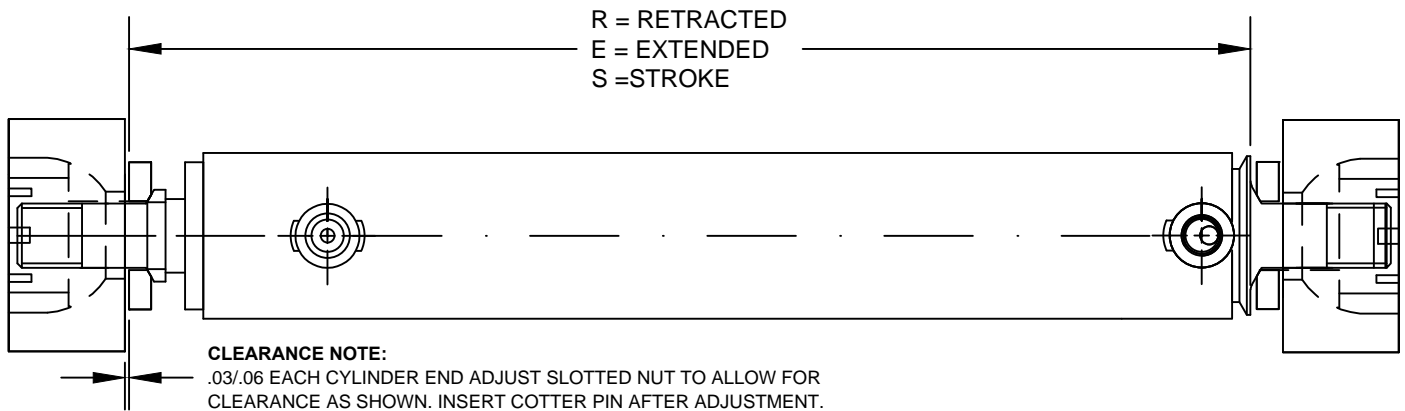
| QTY | PART # | DESCRIPTION |
|-----|----------|--------------------------------|
| 1 | 111627 | PRESSURE REDUCE / RELIEF VALVE |
| 1 | 103813 | FLOW DIVIDER |
| 1 | 112406.2 | BI-DIRECTIONAL RELIEF VALVE |
| 2 | 112406.1 | RELIEF VALVE |
| 3 | 111244 | P.O. CHECK CARTRIDGES |

CYLINDER ASSEMBLY

Drawing Reference 101251.70

| PART # | R | E | S | NET STROKE |
|-----------|-------|-------|-------|------------|
| 101251.70 | 29.18 | 52.74 | 24.50 | 23.56 |

| # | QTY | PART# | DESCRIPTION | 9 | 1 | 100028.314 | BACK-UP RING LSP |
|---|-----|------------|----------------------------|----|---|------------|------------------|
| 1 | 1 | 101257.64 | CYLINDER TUBE | 10 | 1 | 100029.314 | O-RING LSP |
| 2 | 1 | 100965.112 | ROD | 11 | 1 | 101260 | WEAR RING LSP |
| 3 | 1 | 101256 | PISTON | 12 | 1 | 101034.6 | WIPER LSP |
| 4 | 1 | 101254 | GLAND | 13 | 1 | 100027.2 | LOCKWIRE |
| 5 | 1 | 101261 | SEAL KIT (ITEMS 6 THRU 13) | 14 | 1 | 100029.203 | O-RING LSP |
| 6 | 1 | 101035 | MODIFIED ESNA NUT | 15 | 1 | 101651.9 | SPACER |
| 7 | 1 | 100032.095 | POLE PAK LSP | | | | |
| 8 | 1 | 100031.059 | POLY PAK LSP | | | | |



CYLINDER SERVICE

- Prior to assembly lubricate seals, cylinder bore and rod with STP.
- Inspect all parts for scratches, nicks and gouges- -replace all damaged components.
- Inspect cylinder bore and rod for scoring- -replace if scored
- Avoid damage to seal grooves- -use a dull screwdriver for seal removal
- Torque piston nut to 110 FT/LBS. (15.3 kg-m)

CLAMP ADJUSTMENTS

CLAMP FORCE CHECK/ADJUSTMENT

1) Check water pressure. If out of operating range fill with Loron Pneumatic Fluid pump # 112909.

Note: when operating in below freezing temperatures us RV antifreeze in place of water.

2) Check the clamp force centered on lower pad.

OPEN FORCE CHECK/ADJUSTMENT

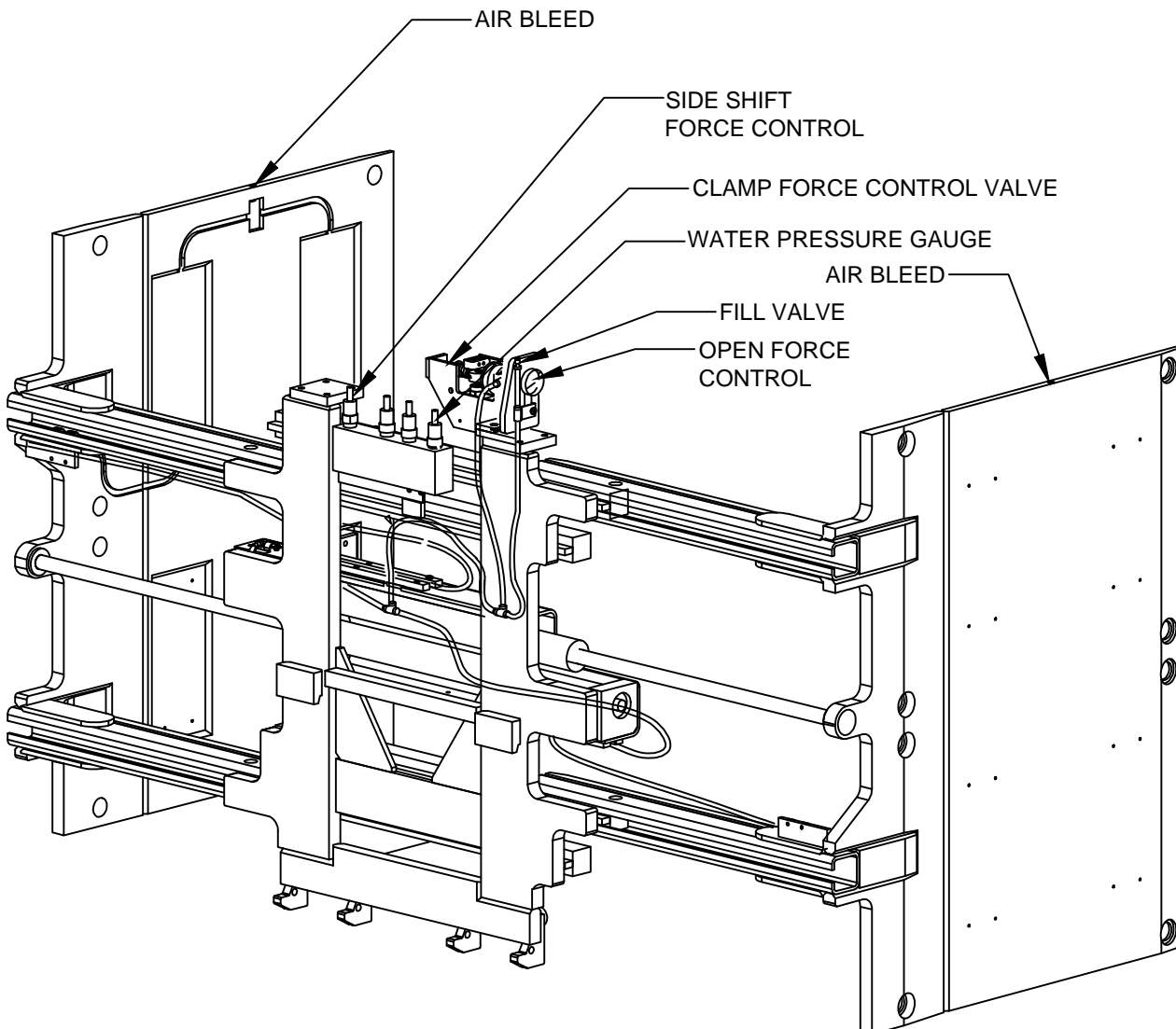
Open the arms against a force fixture and adjust for desired maximum force.

SIDE SHIFT FORCE ADJUSTMENT

1) Clamp on the heaviest load that will be handled

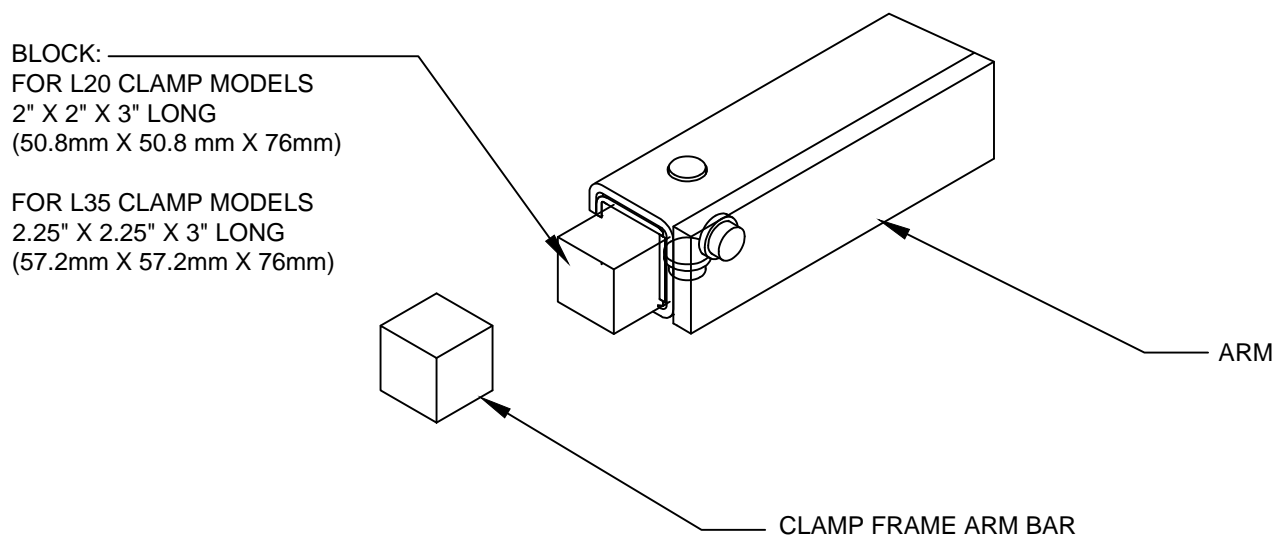
2) Adjust the side shift force down until the arms stop

3) Turn the adjusting screw one turn in.



ARM SLIDE & SHIM REPLACEMENT

1. To replace the slides extend the arms to the fully open position. Release system pressure prior to removing the arms by turning the truck off and working the side shift and clamp function controls several times.
2. Support the arm with an overhead crane or lift truck. Be sure to secure the chain or sling in a manner that prevents the arm from falling out of the chain or sling when hanging free of the clamp frame.
3. Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, carefully slide the clamp arm off of the clamp frame.
4. Install the arm on the clamp frame ensuring that the arm moves freely without excessive binding. If the arm is too loose or too tight add or remove shims as required. Once the clearance is satisfactory insert the cylinder rod into the cylinder anchor on the arm. Install the spherical bearing, nut and cotter pin onto the cylinder rod end. Be sure to leave .03" - .06" (.7mm to 1.5mm) clearance to allow the cylinder to "float" on it's mountings (see page 14). Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, carefully slide the clamp arm off of the clamp frame.



5. Inspect slides and slide buttons for wear. Slides may be rotated end-for-end and re-used if excessively worn on the outer end only. Extra shims may be used to tighten operating clearance on slightly worn slides. Replace any slides worn to less than .06" (1.5mm) thick or any slide that is deeply scored or broken.
6. To aid in replacing the slides a block may be fashioned of wood or another convenient material to the dimensions shown above. The block is inserted in the end of the arm to hold the slides, shims and buttons in position while the arm is inserted over the arm bars on the clamp frame. The block is expelled out the opposite end of the arm as the arm is pushed onto the frame.
7. Prior to installing the arm the block may be used to determine the number of shims to place under the slides. Adjust the clearance between the slides and the block to provide approximately .06" (1.5mm) running clearance between the slides and arm when installed.

TROUBLE SHOOTING GUIDE

LOADS SLIPPING OR DROPPING

POSSIBLE CAUSES

1. Clamp force set too low
2. Internal leakage in cylinder.
3. Load too heavy for the clamp capacity
4. Load may not be stacked correctly or may need to be unitized
5. Bent arms or contact pads
6. Damaged / leaking hydraulic hose

SOLUTIONS

1. Adjust clamp force page 15
2. Replace cylinder seals. If tube, piston or rod is scored replace with new parts.
3. Consult factory.
4. Restack or unitize load (shrink wrap)
5. Consult factory.
6. Replace damaged hose

CRUSHING LOADS

POSSIBLE CAUSES

1. Clamp force set too high
2. Bent arms or contact pads
3. Leak in bladder system

SOLUTIONS

1. Adjusting clamp force, page 15
2. Consult factory
3. Check for leaks and repair.

ARM CHATTERING OR ERRATIC MOVEMENT

POSSIBLE CAUSES

1. Bent clamp arms
2. Nylon slides sticking
Note: Sticking slides can cause inconsistent clamp force measurements
3. Nylon slides worn, broken or missing.

SOLUTIONS

1. Consult factory
2. Clean slides if necessary, the slides are self lubricating.
3. Replace damaged slides, shims and retaining buttons.